

REMARKS

Applicant acknowledges the objections to the drawings. Replacement drawings will be filed after allowable material is identified in the case.

In the Office Action, the Examiner pointed out a failure of the present application to comply with the requirements of 37 CFR §1.821-1.825. A new CRF diskette, paper copy, statement and separate amendment are included herewith.

Claim Objections / Claim Rejections under 35 U.S.C. §112, second paragraph.

The Examiner pointed out informalities in Claims 5 and 7. They have been corrected by the above claim amendments.

Claims 1, 2 and 4-9 were rejected under 35 U.S.C. §112, second paragraph, for being indefinite. The Examiner helpfully pointed out the elements believed to be indefinite. Those points have been corrected in the claim amendment. Applicants believe that the claims are now properly definite and respectfully request the Examiner to withdraw the objections and the claim rejections under 35 U.S.C. §112, second paragraph.

Claim Rejections under 35 U.S.C. §101.

The Examiner rejected Claims 1, 2, and 4 as being directed to non-statutory subject matter. Corrections to the claims were helpfully suggested by the Examiner. Those corrections have been made in the above amendment. Applicants

respectfully request that the rejections under 35 U.S.C. §101 to Claims 1, 2, and 4 be withdrawn.

Applicants respectfully traverse the rejection of Claim 5 under 35 U.S.C. §101 and under 35 U.S.C. §112, first paragraph. The Examiner contends that it is unclear that a plant other than *Arabidopsis* would show any effect of the described transformation. The Examiner also contends that there is no substantial utility for the described invention. The specification and the literature described therein demonstrate the widespread occurrence of CKB proteins over a wide range of organisms. It also demonstrates that these proteins are highly conserved. The specification demonstrates the connection of the novel disclosed CKB protein to the circadian clock and its linkage to flowering. The specification and literature cited therein shows the highly conserved nature of the circadian clock over a wide range of organisms. Because circadian mechanisms and flowering (especially with their linkage through the phytochrome pathway) are known to be identical or very similar in all or virtually all flowering plants, it is highly likely—almost certain—that manipulation of *CKB3* will alter the clock and flowering in all flowering plants. Control of flowering is one of the “holy grails” of plant physiology. Any plant scientist of ordinary skill in the art would appreciate the utility of the present invention and would have little difficulty in applying the present invention to alter the flowering of other plants. Certainly, the Examiner is aware that *Arabidopsis* is currently the model system of choice for a variety of studies on flowering. Current

models of floral morphogenesis and genetic control are based on *Arabidopsis*. The findings in the *Arabidopsis* system have been demonstrated to apply widely to flowering plants in general. To claim that discoveries in this model system cannot and does not readily apply to other flowering plants is simply not correct in the light of present scientific knowledge. Applicants respectfully that the rejections of Claim 5 be withdrawn.

Rejections under 35 U.S.C. §112, first paragraph.

The Examiner has rejected Claims 7 and 8 under 35 U.S.C. §112, first paragraph. The Examiner contends that antisense constructs are not properly enabled by the present specification. Claim 7 has been amended to address this point. Claim 8 has been amended to remove reference to peptides having only partial homology to Seq. I.D. No. 2. The Examiner's comments on the general applicability (*i.e.*, applicability beyond *Arabidopsis*) has been addressed in the paragraph immediately above the present paragraph. Applicants respectfully request the Examiner to withdraw the rejections to Claims 7 and 8.

Rejections under 35 U.S.C. §102.

The Examiner has rejected Claim 4 as having been anticipated by Collinge et al. This rejection was based on the demonstration by that reference of a transformed yeast containing the *CKB2* from *Arabidopsis*. Strictly speaking this should not be an anticipation because most modern biologist do not consider a

yeast a "plant." When speaking of a "plant" most workers mean "green land plant" (GLP). That aside, the claim in question was intended to refer to *CKB3* and not to the other β subunits. The specification teaches a similarity of 71%v and 75% to the other β subunits. Therefore, it was intended to have this claim show a more stringent similarity. The claim has been corrected to the intended 80% similarity.

The Examiner also rejected Claim 9 as having been anticipated by **Carter et al.** That reference showed that protein inhibitors altered the circadian rhythms in a CAM plant. The paper demonstrated that the apparent primary effect of the inhibitors is mediated through damping of the oscillation of phosphoenolpyruvate carboxylase (PEPc) kinase. Applicants traverse this rejection because there is no showing that PEPc kinase is CK2. To anticipate a claim each and every element must be met. Applicants submit that PEPc kinase is not CK2. Applicants respectfully remind the Examiner that it is not proper to create an anticipation by generalizing both "PEPc kinase" and "CK2" (both specific species of "protein kinase") to the genus "protein kinase." Applicants are gratified that the Examiner here is admitting the widely appreciated connection between circadian rhythms and flowering. The Examiner appears to be admitting that the whole art is so predictable that manipulations of circadian rhythms in leaves anticipate alteration of flowering.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as

amended, are requested. If for any reason the Examiner still finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at the Los Angeles telephone number (310) 734-5200 to discuss the steps necessary for placing the application in condition for allowance.

You are hereby authorized to charge any fees due and refund any surplus fees to our Deposit Account No. 50-1796, referencing docket number 13054.02000.

Respectfully submitted,

CROSBY, HEAFEY, ROACH & MAY

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Red-lined Claim Copy (Revised Rule 121)

1 1. (Once Amended) [A] An isolated nucleic acid comprising [a]
2 the coding sequence of SEQ. I.D. No. 1.

1 2. (Once Amended) A host cell transformed with [containing
2 the] a heterologous nucleic acid having a sequence identical to the nucleic acid of Claim
3 1 or a nucleic acid complementary to said heterologous nucleic acid.[.]

1 4. (Once Amended) A host cell transformed with [expressing
2 the] a heterologous polypeptide having the amino acid sequence of SEQ. I.D. No. 2 or [of
3 Claim 4 of] a heterologous polypeptide having at least [70%] 80% sequence identity to
4 said heterologous polypeptide.

1 5. (Once Amended) A transgenic plant overexpressing [a] the
2 nucleic acid of SEQ. I.D. No. 1 or a nucleic acid complementary to SEQ. I.D. No. 1.

1 6. (Once Amended) A transgenic plant overexpressing a
2 polypeptide selected from the group consisting of [an] the amino acid sequence shown in
3 SEQ. I.D. No. 2 and an amino acid sequence having at least 70% identity to [an] the
4 amino acid sequence shown in SEQ. I.D. No. 2.

1 7. (Once Amended) A method of altering circadian rhythms and
2 flowering in a plant comprising transforming the plant with [a] the nucleic acid sequence
3 of SEQ. I.D. No. 1 [or a nucleic acid sequence complementary to SEQ. I.D. No. 1].

1 8. (Once Amended) A method of altering circadian rhythms and
2 flowering in a plant comprising transforming the plant to alter expression of a
3 polypeptide having either [an] the amino acid sequence of SEQ. I.D. No. 2 [or an amino
4 acid sequence having at least 70% identity to the amino acid sequence of SEQ. I.D. No.
5 2].

 9. (Once Amended) A method of altering circadian rhythms and
flowering in a plant comprising changing [a level of] activity of protein kinase CK2
within the plant.